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MEMORANDUM FOR: [REDACTED]

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SUBJECT: The Role of Observer Teams in a Missile
Flight Test Ban

1. Observer teams will be an essential part of implementing a missile flight test ban as long as nations continue vigorous space flight programs. The best available technical monitoring systems and the potential of those on the drawing boards all fail to satisfactorily answer the critical question re the degree to which an ICBM program is hidden in a space program. Whether or not an answer can be acquired at all is subject to some doubt. However, if an answer is to be attained it will require the acceptance and use of observer teams with considerable freedom of "vehicle-inspection" action.
2. Observer teams staffed with at least some competent missile/space scientists/engineers and permitted access to the vehicle's internal components would be in the best position to acquire the data needed to assess the degree to which a space flight program could be (if not "is") contributing to an ICBM program. (Intelligence sources may be able to determine the intent factor permitting translating the "could be" into "is".) Without rather complete access to payload components, guidance systems, propulsion systems and performance data, the observer team would be only slightly better monitors than certain of the technical systems being considered (i.e., radar) for monitoring a missile flight test ban. Regardless of the numerous intelligence advantages of observer teams, if limited to distant external monitoring, they would fail to accomplish the above primary function in a missile flight ban.
3. The attached paper provides a general treatment of the missile flight test ban observer team problem including some of the mechanics associated therewith. This paper is not intended to answer all the problems inasmuch as many are too closely interrelated with other component parts of the overall problem to permit adequate separate appraisals in a "first-cut" approach. The paper attempts to point out many of the critical factors involved. The "semi-tabling" format used may help in assessing the "negotiability" question.

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2nd Draft
18 January 1960

WORKING PAPER

ON

"OBSERVER TEAMS FOR MONITORING A
MISSILE^{1/} / FLIGHT^{2/} / TEST BAN"

- I. PURPOSE-- To define, in very general terms, ^{3/} the responsibilities, composition, locations, activities, authority and reporting mechanisms of observer teams necessary for implementing and monitoring a missile flight test ban.
- II. ASSUMPTIONS ^{4/}
 - A. A missile flight test ban is desirable and feasible
 - B. A space flight program will be continued
 - C. Nations^{5/} with current and potential missile capabilities will accept observer teams as a necessary part of monitoring a missile test ban.

- 1/ The scope and type of missile included in the flight test ban will be determined by the committee.
- 2/ Static test facilities have not been considered in this study.
- 3/ This paper is intended to highlight the problem and suggest some general views thereon; it is not intended to provide the complete answer. Many aspects of the problem are too interrelated with other problems to permit a finite treatment herein.
- 4/ This study does not attempt to judge the validity of any of the assumptions; the assumptions are made in order to permit a "first-cut" of the subject. Changes in these assumptions would therefore necessitate changes in the paper.
- 5/ Nations to be included will depend on the scope of the missile flight test ban.

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III. DISCUSSION

A. Responsibilities of Observer Teams

1. The primary responsibility of the observer teams will be to assure that unacceptable^{6/} violations of the missile flight test ban do not occur.
2. A secondary responsibility will be acquiring data from space flight activities necessary for accomplishing the primary responsibility, and needed for assessing the degree to which space flight activities are contributing to advancing capabilities of the missiles systems banned from flight testing and/or deriving new weapons systems, thus possibly altering the desired "stability".
3. Additional responsibilities of individual team members should include:
 - a. Maintaining a "finger on the pulse" of a nation's military, economic and political posture and objectives;
 - b. Watching for scientific or technological advances or "breakthroughs" likely to alter the "stability";
 - c. Determining leads to future space flight activities and/or objectives; and
 - d. Acquiring any other available information pertinent to maintaining the "stability".

6/What constitutes "unacceptable" missile flight test will be determined by the committee.

B. Composition and Locations of Observer Teams

1. The exact composition of an observer team will depend upon its responsibilities, location and/or required mobility, activities, reporting mechanisms and "housekeeping" functions. For the purpose of this study, it is assumed that all "housekeeping" functions will be provided by the host nation, and are therefore not considered further herein.

2. In order to accomplish the foregoing responsibilities, it is necessary to consider two types of observer teams: (a) Fixed ground observer teams; and (b) mobile observer teams. Although the basic responsibilities are generally the same for each type, certain differences in method of operation may generate some difference in composition thereof. Consequently, they will be treated separately.

3. Fixed Ground Observer Teams -- A ground observer team will be located at each of the known or declared missile/space flight test facilities previously agreed to by the participating nations.

a. Personnel^{7/} of a Fixed Ground Observer Team might include:

(1) Missile/Space Engineer (Team Leader) with flight test range experience.

7/ The nationality of the team members to be determined by agreement. The team captain must not be from host nation; no more than one member (if any) of the team should be from host nation.

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(2) Electronics Engineer (Deputy Team Leader) with missile/space systems experience.

(3) Propulsion Engineer with missile/space systems experience.

(4) Communications Officer/Radio Operator

(5) Photographer Technician

b. Equipment of a Fixed Ground Observer Team might include:

(1) Technical devices as aids to accomplishing task
(To be determined).

(2) Photographic (To be determined)

(3) Communication equipment - pouch and radio (To be determined)

4. Mobile Observer Teams^{8/} One or more mobile observer teams will be required to monitor missile/space flight test activities conducted at locations other than the above agreed to facilities being monitored by fixed ground inspection teams.^{9/} This team or teams could be co-located with host nation's space headquarters and/or geographically located to facilitate ready access to diversified areas of likely concern. Upon

8/ The number and locations of mobile observer teams will depend, in part, on the scope of the missile flight test ban, on the size of the country, on the need for and agreement upon freedom of movement, and on the transportation available for the team's use.

9/ This paper does not consider the problem of monitoring missile/space flight activities conducted from ocean vessels-ships or submarines. This is a critical factor, but should be considered as a separate subject.

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advance notice from host nation of an impending space firing at a locale not monitored by a fixed ground observer team a mobile observer team would proveed to the specified location, "inspect" and "observe" the firing. The freedom, desirability and negotiability of these teams inspecting other areas, suspect of missile/space flight testing based on other data, will have to be determined in light of many factors outside the realm of this paper, which factor could affect the composition, equipment and mode of operating.

a. Personnel^{10/} of a Mobile Observer Team might include:

- (1) Missile/Space Engineer (Team Leader)
- (2) Missile/Space Engineer (Deputy Team Leader)
- (3) Photographer Technician
- (4) Communication Officer/Radio Operator

b. Equipment of a Mobile Observer Team might include:

- (1) Technical devices as aids to team (to be determined)
- (2) Photographic (to be determined)
- (3) Communications Equipment (to be determined)

10/ Personnel of the mobile teams could also serve as a "reserve" element for the fixed ground observer teams and possibly vice versa depending on the level of flight test activity.

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B. Activities and Authority of Observer Teams 11/

1. Prior to the actual launching the observer team should be provided the intended objectives of the flight, a description of the vehicle to be used including technical data on the propulsion and guidance systems, a detailed description and purpose of each component of the payload,^{12/} and a technical description and location of associated ground guidance and tracking equipment. The technical members of the observer teams should study this data and be authorized to ask and receive answers to questions generated thereby.

2. Prior to final launch preparedness (i.e., before fueling) the members of the observer team should be permitted to inspect the vehicle including payload. Such an inspection could be accomplished with scientists of the host nations and probably could be completed in about one to two hours, depending on the type of payload.

11/ Specific activities and authority will depend at least in part on the required inspection/monitoring to maintain "stability" (outside the scope of this paper) and the negotiability thereof. This section applies to both fixed and mobile teams.

12/ The degree to which an observer team should be permitted to inspect the "payload" may well depend on the international "atmosphere" concerning reconnaissance satellites. It is extremely desirable, if not essential, that reconnaissance satellites be a part of a U.S. space program.

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3. The team leader would inspect the "payload". This inspection would involve actual "looking at" the components and could include the removal of "black-box" covers should there be any question as to the purpose per the previously provided data thereon. The team leader would also inspect the entire vehicle for any hidden or undeclared equipment affecting the observer teams responsibilities.

4. The electronics engineer would visually inspect the internal guidance (including beacons if used) and control equipment, including "cover-off" inspections as required. In addition, he would be permitted to inspect the associated ground guidance and tracking equipment.

5. The propulsion engineer would visually inspect the propulsion system of the vehicle as well as the ancillary ground equipment. He should also be permitted to witness the fueling operation.

6. The photographer should be available to the team for taking any pictures desired by a team member to facilitate accomplishing the teams main responsibilities. A complete set of pictures should become a part of a central international file on each space firing.

7. At least one member of the team should maintain a "close" observation of the vehicle until "area clear" for launch signal to assure that no major changes are made.

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8. During a firing one or more of the senior technical members of the observer team should be permitted to witness the launching from the block-house and to follow the trajectory on the tracking display panel. If a space shot, computed trajectory data throughout the course should be available to the observer team on a timely basis, as well as the results/data acquired from telemetry. Copies of trajectory data and results of flight should be made available to the international control center.

9. After the firing the team will prepare a consolidated report thereon and transmit same via secure means to the international control center. A copy would be provided host nation simultaneously.

10. The authority and activities of a mobile observer team in inspecting an area from which a missile/space firing is suspected (from other means) of having been or soon will be conducted will depend on many factors outside the scope of this paper. However, this and the firings at sea are certainly critical factors which must be considered in deriving an "effective" monitoring system.

D. Reporting Mechanism of Observer Teams

1. Each observer team must have secure communication media, ^{13/} both radio and manuscript, not under the control or subject to continued serious interference of the host nation. Observer teams would report

^{13/}The details of these communications systems should be worked out by communications experts.

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to a central international body (probably UN sponsored and controlled) whose composition, responsibilities, authority, etc., must be worked out separately. Reporting would consist of (a) providing "schedules" of host nations intended space firings, including type, location and timing, (b) submitting a complete report after launch including results of inspections and the launch per se, and (c) flash reports on changes or new data as required.

2. In addition each observer team member should have a secure means 13/ of communicating with his native country.

13/ The details of these communications systems should be worked out by communications experts.

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